

CLAIMS

[1] A hermetic sealing cap (1) employed for an electronic component storage package including an electronic component storing member (10) for storing an electronic component (20), comprising:

a substrate (2);

a first layer (3), formed on the surface of said substrate, mainly composed of Ni containing a diffusion accelerator;

a second layer (4) formed on the surface of said first layer; and

a solder layer (5) mainly composed of Sn formed on a region of the surface of said second layer to which said electronic component storing member is bonded, wherein

said second layer has a function of inhibiting said first layer from diffusing into said solder layer at a first temperature while diffusing said first layer into said solder layer through said second layer when said solder layer bonds to said electronic component storing member at a second temperature higher than said first temperature.

[2] The hermetic sealing cap according to claim 1, wherein

said first temperature is a temperature at a time of forming said solder layer by melting solder paste (6), and

said second temperature is a temperature at a time of bonding said hermetic sealing cap to said electronic
5 component storing member by melting said solder layer.

[3] The hermetic sealing cap according to claim 1 or 2, wherein

said second layer is made of Ni.
10

[4] The hermetic sealing cap according to claim 3, wherein

said second layer has a thickness of at least 0.03 μm and not more than 0.075 μm .
15

[5] The hermetic sealing cap according to any of claims 1 to 4, wherein

said first layer contains 7.5 mass % to 20 mass % of Co as said diffusion accelerator.
20

[6] The hermetic sealing cap according to any of claims 1 to 5, wherein

said substrate is made of an Fe-Ni-Co alloy.

25 [7] The hermetic sealing cap according to any of

claims 1 to 6, wherein

said first layer and said second layer are formed by plating.

5 [8] The hermetic sealing cap according to claim 7, wherein

said first layer is formed on the whole area of the surface of said substrate, and

10 said second layer is formed on the whole area of the surface of said first layer.

[9] The hermetic sealing cap according to any of claims 1 to 8, wherein

15 said solder layer contains no Pb, and contains Ag.

[10] An electronic component storage package including an electronic component storing member (10) for storing an electronic component (20), comprising:

20 a hermetic sealing cap (1) including a substrate (2), a first layer (3), formed on the surface of said substrate, mainly composed of Ni containing a diffusion accelerator, a second layer (4) formed on the surface of said first layer and a solder layer (5) mainly composed of Sn formed on a region of the surface of said second layer to which
25 said electronic component storing member is bonded, with

said second layer having a function of inhibiting said first layer from diffusing into said solder layer at a first temperature while diffusing said first layer into said solder layer through said second layer when said solder layer bonds to said electronic component storing member at a second temperature higher than said first temperature, wherein

a third layer (14) is formed on a portion of said electronic component storing member corresponding to said solder layer,

said solder layer and said third layer are bonded to each other, and

an intermetallic compound (7) containing Sn of said solder layer is formed on the junction between said hermetic sealing cap and said electronic component storing member.

[11] The electronic component storage package according to claim 10, wherein

the junction between said hermetic sealing cap and said electronic component storing member contains an intermetallic compound consisting of an Ni-Sn alloy, and

a portion of said second layer corresponding to the junction between said hermetic sealing cap and said electronic component storing member diffuses in said

intermetallic compound.

[12] A method of manufacturing a hermetic sealing cap
(1) employed for an electronic component storage package
5 including an electronic component storing member (10) for
storing an electronic component, comprising steps of:

preparing a substrate (2);

forming a first layer (3) mainly composed of Ni
containing a diffusion accelerator on the surface of said
10 substrate;

forming a second layer (4) on the surface of said
first layer; and

forming a solder layer (5) mainly composed of Sn on a
region of the surface of said second layer to which said
15 electronic component storing member is bonded, wherein

the step of forming said second layer includes a step
of forming the second layer having a function of
inhibiting said first layer from diffusing into said
solder layer when forming said solder layer at a first
20 temperature while diffusing said first layer into said
solder layer through said second layer when said solder
layer bonds to said electronic component storing member at
a second temperature higher than said first temperature.

25 [13] The method of manufacturing a hermetic sealing

cap according to claim 12, wherein

the step of forming said solder layer includes steps of arranging solder paste (6) mainly composed of Sn on a region of the surface of said second layer to which said electronic component storing member is bonded and forming said solder layer mainly composed of said Sn by melting said solder paste at said first temperature.

[14] The method of manufacturing a hermetic sealing cap according to claim 12 or 13, wherein said second layer is made of Ni.

[15] The method of manufacturing a hermetic sealing cap according to claim 14, wherein said second layer has a thickness of at least 0.03 μm and not more than 0.075 μm .

[16] The method of manufacturing a hermetic sealing cap according to any of claims 12 to 15, wherein said first layer contains 7.5 mass % to 20 mass % of Co as said diffusion accelerator.

[17] The method of manufacturing a hermetic sealing cap according to any of claims 12 to 16, wherein said substrate is made of an Fe-Ni-Co alloy.

[18] The method of manufacturing a hermetic sealing cap according to any of claims 12 to 17, wherein

the step of forming said first layer includes a step
5 of forming said first layer by plating, and

the step of forming said second layer includes a step of forming said second layer by plating.

[19] The method of manufacturing a hermetic sealing
10 cap according to claim 18, wherein

the step of forming said first layer by plating includes a step of forming said first layer on the whole area of the surface of said substrate, and

the step of forming said second layer by plating
15 includes a step of forming said second layer on the whole area of the surface of said first layer.

[20] The method of manufacturing a hermetic sealing cap according to any of claims 12 to 19, wherein

20 said solder layer contains no Pb, and contains Ag.